

CLAIMS:

1. Downhole apparatus for selectively isolating the interior of a downhole assembly from the exterior thereof, the downhole apparatus comprising: a body defining a longitudinally extending bore and incorporating a wall having at least one aperture therein for providing fluid communication between said bore and the exterior of the downhole apparatus; a piston located within the body and slidable longitudinally therein so as to allow movement of the downhole apparatus between an open configuration, in which said at least one aperture is open to permit fluid communication between said bore and the exterior of the downhole apparatus via said at least one aperture, and a closed configuration, in which said at least one aperture is occluded by the piston to restrict fluid communication between said bore and the exterior of the downhole apparatus via said at least one aperture; a control groove and a pin received within the control groove for determining whether or not a longitudinal movement of the piston in a given direction will move the downhole apparatus between open and closed configurations; and a control member located between and movable relative to the body and the piston, the control groove being defined in one of the piston and control member, and the pin being provided on the other of the piston and control member; the downhole apparatus being characterized in that means are provided for constraining movement of the piston relative to the body to longitudinal movement only.
2. Downhole apparatus as claimed in claim 1, wherein said means for constraining relative movement between the piston and the body comprises a straight groove extending in a longitudinal direction, said straight groove being provided on one of the piston and body, and a portion of the other of the piston and body being received within said groove.
3. Downhole apparatus as claimed in claim 2, wherein said portion of piston or body is provided as a discrete pin separate from the piston or body.

4. Downhole apparatus as claimed in any of the preceding claims, wherein, in use, said constraining means limits the extent of longitudinal movement of the piston relative to the body.
5. Downhole apparatus as claimed in any of the preceding claims, wherein the piston is biased in a longitudinal direction by biasing means towards a plurality of positions relative to the body in which the downhole apparatus is in a closed position, and the control groove is adapted to allow movement from the closed configuration to the open configuration only after a predetermined number of longitudinal movements of the piston against the bias of the biasing means.
6. Downhole apparatus as claimed in any of the preceding claims, wherein means are provided for preventing longitudinal movement of the control member relative to the body.
7. Downhole apparatus as claimed in claim 6, wherein said means for preventing movement of the control member comprises a groove extending in a plane perpendicular to the direction of longitudinal movement and a pin located in said groove; the groove being defined in one of the body and control member, and the pin being provided on the other of the body and control member.
8. Downhole apparatus as claimed in any of the preceding claims, wherein the piston is releasably secured to the body by means of a collet when moved to a predetermined longitudinal position relative to the body.
9. Downhole apparatus as claimed in any of the preceding claims, wherein only one portion of the control groove permits movement of the piston to said predetermined longitudinal position relative to the body so as to allow the piston to become secured to the body by means of the collet.

10. A circulating sub as claimed in any of the preceding claims.
11. A circulating sub for selectively isolating the interior of a downhole assembly from the exterior thereof, the circulating sub comprising: a body defining a longitudinally extending bore and incorporating a wall having at least one aperture therein for providing fluid communication between said bore and the exterior of the sub; a piston located within the body and slidable longitudinally therein so as to allow movement of the sub between an open configuration, in which said at least one aperture is open to permit fluid communication between said bore and the exterior of the sub via said at least one aperture, and a closed configuration, in which said at least one aperture is occluded by the piston to restrict fluid communication between said bore and the exterior of the sub via said at least one aperture; a control groove and a pin received within the control groove for determining whether or not a longitudinal movement of the piston in a given direction will move the sub between open and closed configurations; and a control member located between and movable relative to the body and the piston, the control groove being defined in one of the piston and control member.
12. Apparatus as claimed in any of the preceding claims, wherein the control groove defines a closed loop circumscribing a longitudinal axis of the apparatus.
13. Downhole apparatus substantially as hereinbefore described with reference to and as shown in the accompanying drawings.